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Improving Handoff to Decrease Sepsis Mortality: A Quality Improvement Project

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The Clinical Nurse Leader (CNL) is prepared at the master's degree level. CNLs practice across populations in healthcare settings, with a focus on quality improvement, interprofessional communication, evidence-based practice, and care coordination at the point-of-care (Harris, Roussel, & Thomas, 2018). One of the key roles of the CNL is being a risk anticipator, which is the ability to critically evaluate and anticipate risk to client safety (King & Gerard, 2016). The CNL role provides the basis for point-of-care clinical leadership within a microsystem. They are trained to evaluate specific patient populations within all units in a healthcare setting. Working closely with subgroups allows CNL's to continuously assess risk factors and utilize evidence-based research and practice to mitigate negative outcomes (Harris, Roussel, & Thomas, 2018).

Statement of the Problem

Sepsis is a potentially life threatening clinical syndrome, resulting from an infection. Various infections can lead to sepsis which is characterized by organ failure, thereby making it difficult to diagnose (Novosad, et al., 2016). Sepsis has high morbidity and mortality rates which contributes to increased cost. In 2013, sepsis accounted for over $23 billion in health care expenditures (Novosad, et al., 2016).

According to Moore, Vermuelen, Taylor, Kihara, and Wahome (2019) in 2015, the Centers for Medicare & Medicaid Services (CMS) recommended time-sensitive bundled-care interventions that should occur within 3 hours of time zero. Time zero is the time of triage in the Emergency Department (ED). These interventions include:

- Measuring lactate level
- Blood cultures

- Complete blood cell count (CBC)
- Administering 30ml/kg crystalloid intravenous (IV) fluid for hypotension, or lactate level of 4 mmol/L or more;
- Administering broad-spectrum antibiotics

The 6 hour bundle includes the use of vasopressors if needed after initial fluid resuscitation to maintain the patient's mean arterial pressure at 65 mm Hg or more levels (Moore, Vermuelen, Taylor, Kihara, & Wahome, 2019).

Literature Review

The search for evidence commenced by formulating a population, intervention, and outcome (PIO) question. During nurse-to-nurse transfer of care of critical care patients (P), does the use of a standardized handoff tool (I) decrease negative patient outcome (O). Based on the PIO question, an electronic data search was conducted utilizing CINAHL. Three articles were selected for the literature review. They were published between 2016 and 2019.

Zou and Zhang (2016) conducted a prospective intervention study to improve the handoff process and decrease nursing errors by standardizing the nursing handoff form (NHF). The study used a 1-group pre-test and post-test quasi experimental design conducted on an inpatient medical unit in a general hospital in China. A standardized NHF was designed and utilized as an intervention during nursing handoff of medical patients. Zou & Zhang (2016) concluded that usage of the standardized NHF in the nursing handoff process contributed to a significant reduction in total nursing errors and handoff-related nursing errors.

Pandya et al. (2019) designed and implemented a quality improvement intervention which included a standardized handoff process involving the electronic medical record (EMR). The goal was to improve communication between clinic and infusion nurses for patients

receiving cancer treatments. The study involved a multidisciplinary team at the Wilmot Cancer Institute (WCI) at University of Rochester Medical Center in upstate New York. The intervention included evaluation of current workflow process mapping, identifying gaps, limitations, patient waiting times, and potential causes of ineffective handoffs. Pandya et al. (2019) discovered reduction of medication errors related to ineffective handoffs (60% pre-intervention to 32% post-intervention), increase use of handoff tool and completion (32% pre-intervention to 86% post-intervention), and 2 minutes/patient/month reduction in patient wait times.

In summary, the review of the literature supports the benefits of standardizing the handoff process between nurses when caring for critical patients. It is important that handoffs are structured to provide necessary patient information thereby, optimizing patient care utilizing evidence-based practice. Standardized-handoffs lead to reduced medication errors, increased patient satisfaction, and reduction in nursing errors. This project notes the significance in the role of a CNL in the microsystem, such as that of a risk anticipator by isolating communication issues between nurses involving patient care.

Methodology

Setting

The project's organization is one of the largest medical centers in Contra Costa County in Northern California. The facility is a 554-bed acute care hospital designated as a level two trauma center which serves Contra Costa County and parts of Solano County. It is part of a not-for-profit healthcare system. The American Nurses Credentialing Center (ANCC) honored this facility with Magnet recognition status for excellence in nursing services and quality nursing

care. Staff support for this project includes ED nurse educator, Epic liaison, University of San Francisco (USF) clinical instructor and 3 CNL students.

In 2018 the facility reported a 10.15% sepsis mortality rate. A multidisciplinary team was formulated to reduce their sepsis mortality rate by 1% over the next year. Many patients diagnosed with sepsis are often first triaged in the ED. Therefore, the ED decided to evaluate their department for better process improvement. A team was formed involving the nurse educator, an Epic liaison, a USF clinical instructor and 3 CNL students.

Intervention

The team focused on improving communication between ED nurses and receiving unit nurses by increasing utilization of Sepsis Checklist (available in paper format) and creating a sepsis checklist within EPIC. The ED and floor nurses had a sepsis checklist available as a paper tool title "Sepsis Action Checklist" (see Appendix A). A staff survey was prepared to assess general knowledge of ED nurses regarding sepsis knowledge and time-sensitive care (See Appendix B). 106 nurses were surveyed within the ED, floor units and Intensive Care Units (ICU). The survey results revealed varying responses to the facilities sepsis protocols regarding time of repeat lactate draws and knowledge of the paper tool. Overall satisfaction with handoff report of sepsis patients was slightly over 54% and over 79% of receiving nurses reported feeling inadequately prepared to continue patient care after receiving patients from ED (See Appendix C).

The team also focused on utilizing the healthcare organization's Electronic Health Records (EHR), EPIC, to improve inter-department communication regarding sepsis patients. A root cause analysis revealed ED nurses were charting in a narrator in EPIC verses floor nurses who charted in an EPIC flowsheet. Information regarding sepsis patients were not being

translated in an efficient manner for receiving units. Time-sensitive care such as repeat lactate times were at risk of being over looked by caregivers. Furthermore EPIC did not have a dedicated sepsis alert or sepsis navigator present.

The three aims of this quality improvement project were to implement use of standardized paper checklist during transfer of sepsis patients from ED to all other units, create sepsis checklist in EHR to eliminate paper checklist, and re-educate ED nurses of abnormal signs and symptoms of sepsis in the geriatric population. The 3 CNL students launched "Sepsis Week" in the ED. During this time, 47 in-services were held and presented information about standardizing the handoff process, sepsis mortality statistics and availability of the paper sepsis checklist. (See Appendix E).

Based on the results of the survey, a solution was determined through collaboration with key stakeholders. To meet the needs of both the ED and inpatient units, an electronic health record-based sepsis checklist (sepsis navigator) similar to the 2019 sepsis action paper checklist would be a suitable substitute for the inpatient units. The ED would retain the use of their sepsis narrator tool, however, input data from the ED will auto populate into the sepsis navigator for the inpatient side to access. To implement the idea, several meetings were arranged with an EPIC health systems liaison to determine the viability of a sepsis navigator given the current algorithms in place.

Fortunately, a sepsis navigator would be possible to create, but our group met an inopportune barrier. The medical center is going to experience a system-wide EPIC interface upgrade in early 2020 and with such an update requires careful consideration of the addition of a new data entry form. With that, the implementation of a sepsis navigator has been moved to the year 2020 in parallel to the system-wide EPIC interface upgrade.

In summary, the review of the literature supports standardization of handoffs in critical care and the benefits of improved nurse-to-nurse communication such as decrease in medication errors. It is important that nursing staffs have knowledge of risk attributed to communication barriers, the importance of continuous care, strategies to implement cohesiveness between departments, negative patient outcomes related to improper handoffs, and its effect on patient satisfaction and nursing workflow. This project demonstrates the significance of the role of a CNL in the microsystem such as that of a risk anticipator by evaluating workflows and processes to prevent negative patient outcomes and meet regulations.

References

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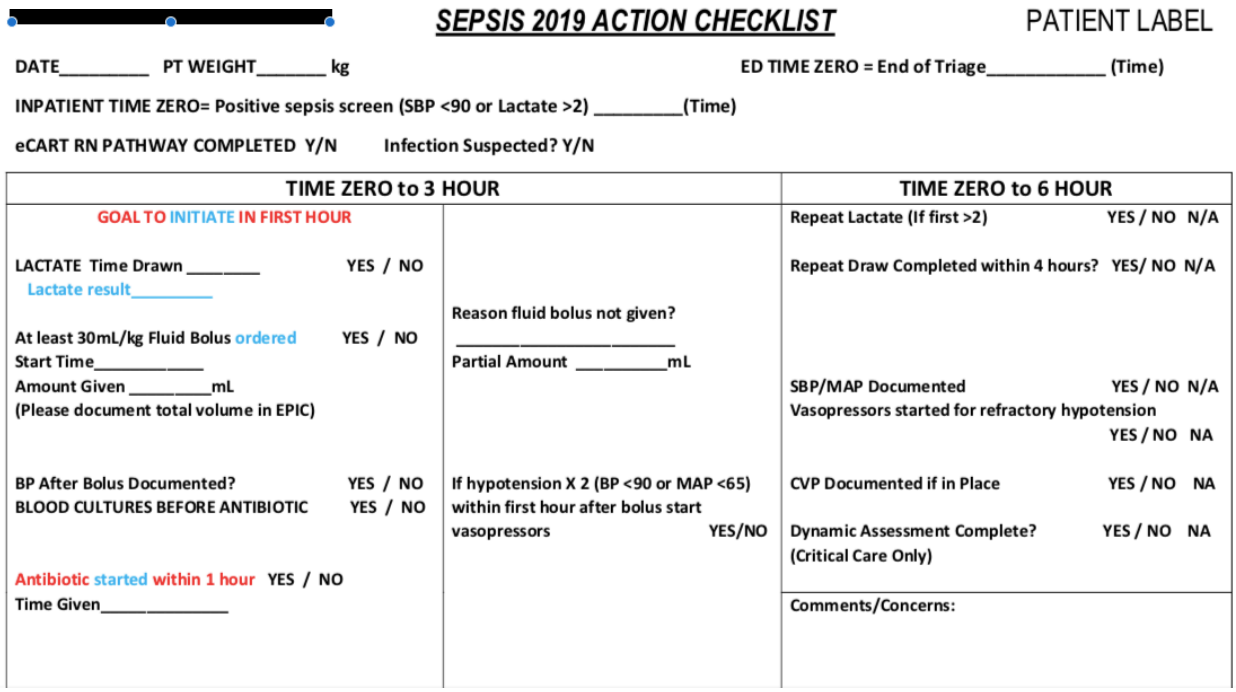
Appendix A

Figure 1



SEPSIS 2019 ACTION CHECKLIST PATIENT LABEL

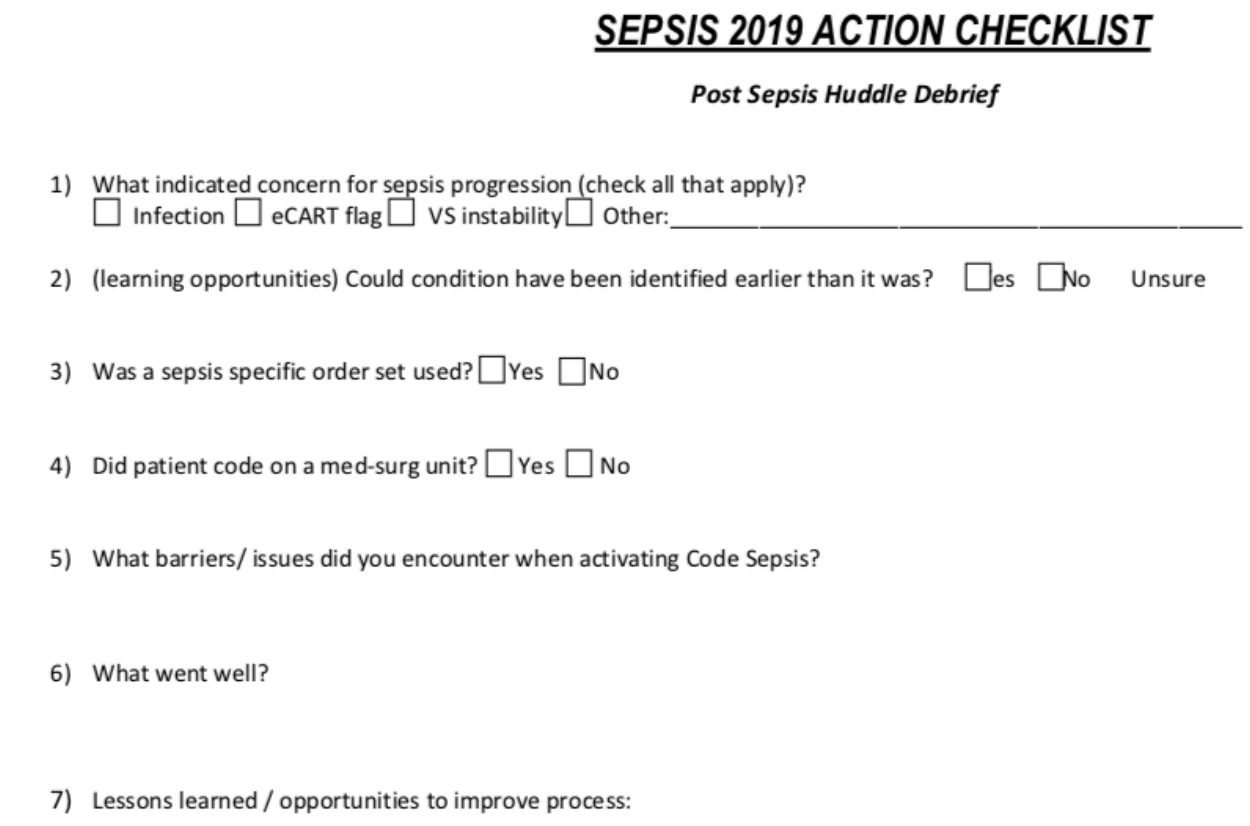
DATE_____ PT WEIGHT_____ kg ED TIME ZERO = End of Triage_____ (Time)

INPATIENT TIME ZERO= Positive sepsis screen (SBP <90 or Lactate >2) _____(Time)

eCART RN PATHWAY COMPLETED Y/N Infection Suspected? Y/N

TIME ZERO to 3 HOUR		TIME ZERO to 6 HOUR
GOAL TO INITIATE IN FIRST HOUR		Repeat Lactate (If first >2) YES / NO N/A
LACTATE Time Drawn _____ YES / NO Lactate result_____		Repeat Draw Completed within 4 hours? YES/ NO N/A
At least 30mL/kg Fluid Bolus ordered YES / NO Start Time_____ Amount Given _____mL (Please document total volume in EPIC)	Reason fluid bolus not given? _____ Partial Amount _____mL	SBP/MAP Documented YES / NO N/A Vasopressors started for refractory hypotension YES / NO NA
BP After Bolus Documented? YES / NO BLOOD CULTURES BEFORE ANTIBIOTIC YES / NO	If hypotension X 2 (BP <90 or MAP <65) within first hour after bolus start vasopressors YES/NO	CVP Documented if in Place YES / NO NA Dynamic Assessment Complete? YES / NO NA (Critical Care Only)
Antibiotic started within 1 hour YES / NO Time Given_____		Comments/Concerns:

Figure 2



SEPSIS 2019 ACTION CHECKLIST

Post Sepsis Huddle Debrief

1) What indicated concern for sepsis progression (check all that apply)?
☐ Infection ☐ eCART flag ☐ VS instability ☐ Other:_____

2) (learning opportunities) Could condition have been identified earlier than it was? ☐es ☐No Unsure

3) Was a sepsis specific order set used? ☐Yes ☐No

4) Did patient code on a med-surg unit? ☐Yes ☐No

5) What barriers/ issues did you encounter when activating Code Sepsis?

6) What went well?

7) Lessons learned / opportunities to improve process:

Appendix B

Full text of Staff Surveys for the Emergency Department

-When does the sepsis “clock” begin?

-What are the current standards of fluid resuscitation for sepsis patients?

-Within what period of time should antibiotics be given for sepsis patients?

-When should a repeat lactate be drawn?

-Are you aware of the “sepsis checklist” that is used on the floor/unit ?

-In your handoff report, do you report what "Sepsis actions" still needs to be completed and by what time it needs to be completed by?

-Are the floor/unit staff generally satisfied with your sepsis patient handoff information? -Would you like EPIC to auto populate data into the sepsis checklist for you? (staff support)

-What questions do the floor/unit nurse ask about sepsis alert patients?

-What are certain barriers to handoff that you have noticed? (cause and effect)

-What information do you think should be included in a sepsis patient handoff? (staff support)

Full Text of Staff Surveys for Med/Surg, ICU and PCU

-Do you know where to locate the sepsis checklist on your unit?

-Do you know where to locate the ED IP handoff tool in EPIC?

-After receiving sepsis handoff from ED nurses, do you feel adequately prepared to continue care for the patient? (without asking additional questions)

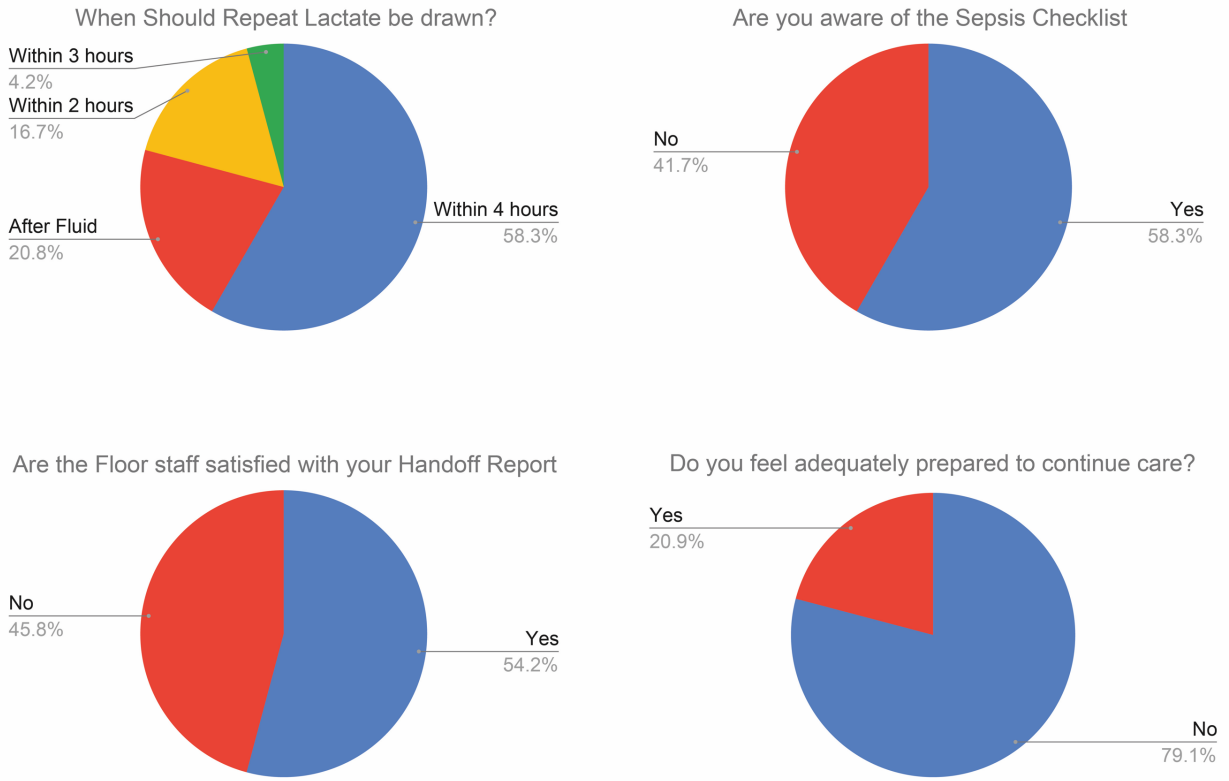
-When receiving sepsis handoff for ED nurses, what information is a priority for you to have

regarding the patient?

-Would it be helpful if the sepsis checklist auto populated into the summary tab for you to view?

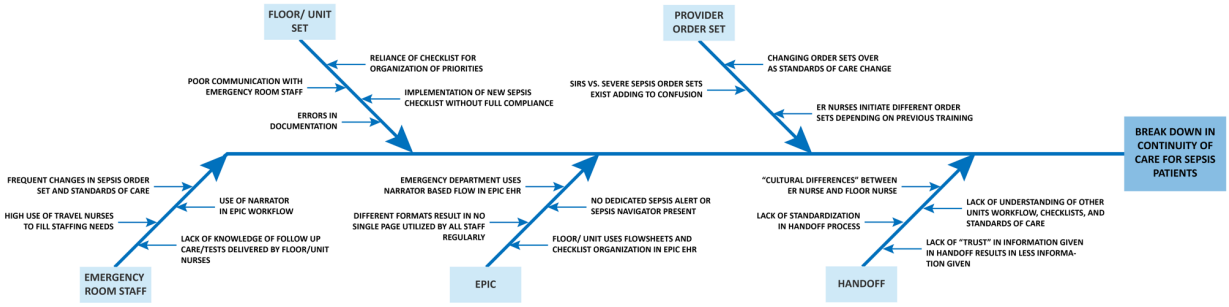
Appendix C

Significant Staff Survey Results



Appendix D

Root Cause Analysis



Appendix E

Sepsis Script

We are students from USF. We have been working with your nurse educator, to improve hand-off between the ED, floor and ICU. Our goal was to maintain continuity of care for sepsis patients.

We surveyed approximately 100 nurses from the ED, floor, and ICU.

Overall the main area of concern was hand-off report.

Mortality rate for 2018 was 10.15%. Our goal is to reduce this number in the upcoming years. 0

When handing off a sepsis patient to another unit please be aware they will be asking you questions from a checklist. Be prepared to answer the following questions:

1. What time was the fluid bolus given and amount.
2. What was the BP after the fluid bolus was given
3. Were blood cultures taken before antibiotics were given
4. What time were antibiotics given
5. What time was the lactate drawn
6. When to draw the next lactate

DON'T FORGET TO CONSIDER SEPSIS IN OUR GERIATRIC POPULATION.

-Fever may be absent in up to half of these patients

-Instead there maybe delirium, altered mental status, malaise, or weakness.

WHAT'S TO COME:

The goal is to get this in electronic checklist in the upcoming months. In the meantime let's work together to provide the best care for these patients.

Thank you so much for your time.